



Extron® Electronics
INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual



DVI DL 101

Dual Length DVI Cable Equalizer

68-1574-01 Rev. A
06 08



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Precautions

Safety Instructions • English



This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.



This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or on the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français



Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).



Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions • Prendre connaissance de toutes les consignes de sécurité et d'électrocution avant d'utiliser le matériel.

Conserver les instructions • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avance.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présents dans la documentation utilisateur.

éviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch



Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.



Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español



Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (el cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.



Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Consevar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be treated so that they are not likely to be stepped on or pinched by items placed against them.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentation • Ne faire fonctionner ce matériel qu'avec une source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité, ne pas le contourner ni le désactiver.

Déconnexion de l'alimentation • Pour débrancher l'équipement de l'alimentation sans danger, débrancher tous les cordons d'alimentation de l'arrière de l'équipement ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pinçés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à des hauteurs tensions et autres dangers.

Fentes et orificios • Si le boîtier de l'appareil comporte des fentes ou des orificios, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent pas être obstruées par des objets.

Lithium Battery • Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacez uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettez au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromabtrennung • Um das Gerät vom Stromnetz zu trennen, sollten Sie alle Netzabläufe aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegen gestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicetechnikpersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schlags versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder anderer Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der elektrischen Teile im Inneren. Die Öffnungen müssen frei von Hindernissen bleiben. Öffnungen blockiert werden.

Lithium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Entsorgen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puenteárla ni eliminarla.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección de los cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Descharar las baterías usadas siguiendo las instrucciones del fabricante.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1001 East Ball Road
Anaheim, CA 92805, USA

Europe, Africa, and the Middle East:
Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Japan:
Extron Electronics, Japan
Kyodo Building
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

安全须知 • 中文



这个符号提示用户该设备用户手册中有重要的操作和维护说明。



这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

电源 • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线（地线）是安全设施，不能不用或跳过。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线，避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂家的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE *This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.*

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1

Chapter One

Introduction

[About this Manual](#)

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Introduction

About this Manual

This manual contains information about the Extron DVI DL 101 Dual Link Cable Equalizer and describes how to connect and operate it. The terms "DVI DL" and "equalizer" are used interchangeably throughout this manual to refer to the product.

About the DVI DL 101 Cable Equalizer

The Extron DVI DL 101 is a dual link cable equalizer that extends Digital Visual Interface (DVI) signals beyond the specified cable limits of 15' (5 m). The DVI DL attaches to the end of a long cable run of up to 275' (84 m) for dual link and up to 200' (61 m) for single link.

Placed just before the display in the cable run, it automatically equalizes and drives the signal, eliminating any noise or dropouts, to ensure optimal image quality. It supports all dual link DVI signals up to 330 MHz, including 2560x1600 @ 60 Hz. Also, because dual link is backwards compatible with single link, all single link rates up to 165 MHz, including 1920x1200 and 1080p @ 60 Hz, are also supported.

The DVI DL passes Extended Display Identification Data (EDID) information and supports the long distance transmission of HDTV signals with High-bandwidth Digital Content Protection (HDCP) for copy protection of digital television broadcasts and high resolution digital video output from DVD, HD DVD, and Blu-ray Disc players. DDC lines are passed through with the option of active buffering to ensure compatibility among various source and display configurations.

With the appropriate adapters from Extron, the DVI DL is fully compatible with the HDMI digital video, audio, and control standard for audio/video products.

Features

- Power/Signal status indicator** — The LED on the front panel lights amber to indicate that power is connected. When a source signal is present, this LED lights green.
- Optional buffering of DDC/HDCP lines** — DDC/HDCP clock and data lines can be actively buffered or passed straight through to the output.
- Enclosure** — Compact 1" (2.5 cm) high, 1/4 rack wide metal enclosure
- DVI input** — One DVI-I female connector accepts a DVI-D input signal and supports dual link rates of up to 330 MHz, as well as all single link rates up to 165 MHz.

The maximum length for input cables is 200' (50.8 m) for the highest rates (330 MHz for dual link; 135 MHz for single link).

- DVI output** — One female DVI-I connector supports DVI-D output.

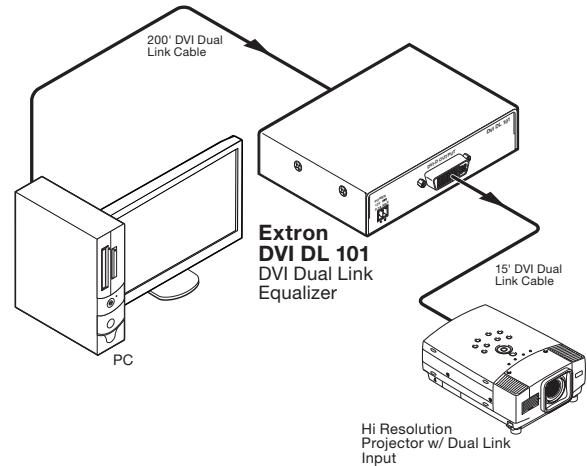
The acceptable output cable length is 16.4' (5 m).

NOTE *Dual link DVI cables must be used for dual link DVI signals. With a single link DVI cable, only single-link signals are possible.*

- Rack and furniture mounting** — The equalizer can be mounted on a rack shelf, or under or through a desk or podium.
- Power supply** — An external international power supply with a two-pin captive screw connector accepts 100 to 240 VAC.

Application Diagrams

The following diagrams show examples of how the DVI DL can be connected.



DVI DL application diagram



2

Chapter Two

Installation and Operation

Mounting the DVI DL 101

Front and Back Panel Features and Connections

Enabling the DDC Buffer

Installation and Operation

Mounting the DVI DL 101

The DVI DL can be mounted on a rack shelf, under or through furniture, attached to a projector pole, or placed on a table top.

Tabletop use

Four self-adhesive rubber feet are included with the DVI DL. For tabletop use, attach one foot at each corner on the bottom surface of the unit.

Rack mounting

The optional accessories available for rack mounting the DVI DL include the following:

- RSF 123 — 3.5" deep 1U VersaTools® rack shelf kit (part #60-190-20)
- RSB 123 — 3.5" deep 1U VersaTools rack shelf (part #60-604-20)
- RSU 126 — 6" deep 1U universal rack shelf kit (part #60-190-10)
- RSB 126 — 6" deep 1U basic rack shelf (part #60-604-10)
- RSU 129 — 9.5" deep 1U universal rack shelf kit (part #60-190-01)
- RSB 129 — 9.5" deep 1U basic rack shelf (part #60-604-01)

UL rack mounting guidelines

The following Underwriters Laboratories (UL) requirements pertain to the installation of the DVI DL 101 into or onto a rack.

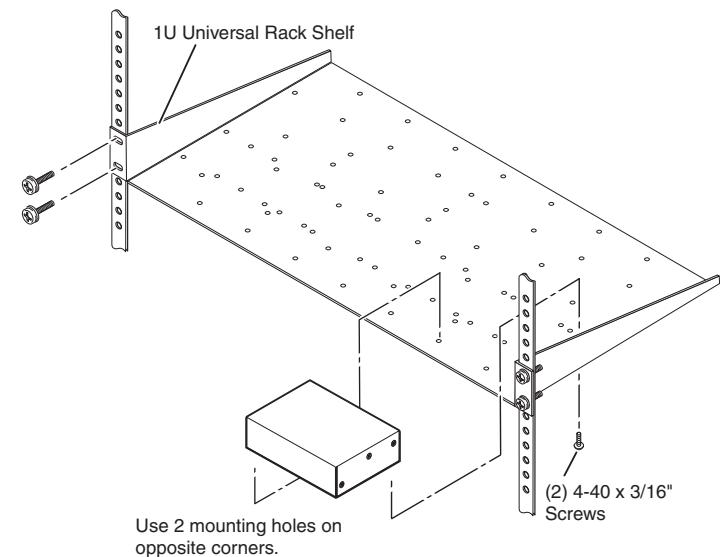
1. **Elevated operating ambient** — If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the +122 °F (+50 °C) maximum ambient temperature (Tma) specified by Extron.
2. **Reduced air flow** — Install the equipment in the rack so that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mount the equipment in the rack so that uneven mechanical loading does not lead to a hazardous condition.
4. **Circuit overloading** — When connecting the equipment to the supply circuit, consider the connection of the equipment to the supply circuit and the effect that circuit overloading might have on overcurrent protection and supply wiring. Consider equipment nameplate ratings when addressing this concern.

5. **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

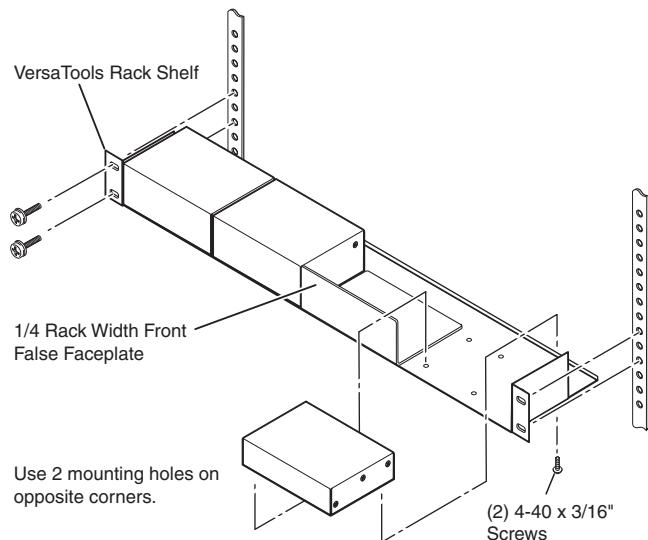
Rack mounting procedure

On the 6" deep and 9.5" deep rack shelves, the unit can be mounted in the front or the rear of the rack.

1. If rubber feet were previously installed on the bottom of the unit, remove them.
2. Secure the DVI DL on the rack shelf, using two 4-40 x 3/16" screws in opposite (diagonal) corners.
3. Install blank panel(s) or other unit(s) on the rack shelf as desired.
4. Insert the shelf into the rack, aligning the holes in the shelf with those of the rack.
5. Secure the shelf to the rack using the supplied machine screws. This shelf can be mounted in the front or in the rear of the rack.



Mounting the DVI DL 100 on a standard rack shelf

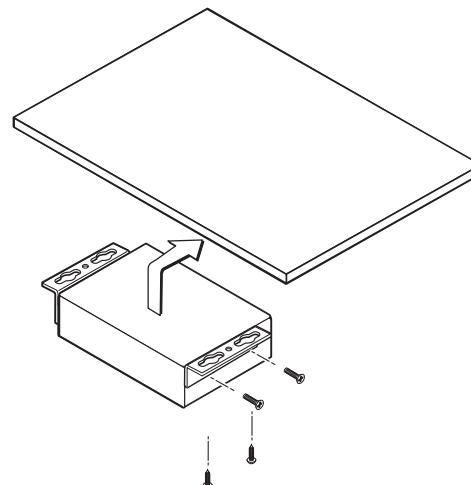


Mounting the DVI DL 101 on a 3.5" deep rack shelf

Under-furniture mounting

The DVI DL can be mounted under a horizontal surface using an optional MBU 125 under-desk mounting kit (part #70-077-01), as follows:

1. If rubber feet were previously attached to the bottom of the unit, remove them.
2. Remove the screws from one side of the unit. Retain the screws for possible later reassembly.
3. Attach one bracket to the side of the unit, using the provided machine screws (see the illustration on the next page).
4. Repeat steps 2 and 3 on the other side of the DVI DL.
5. Hold the unit with the attached brackets against the underside of the table or other furniture. On the mounting surface, mark the location of the bracket's screw holes.



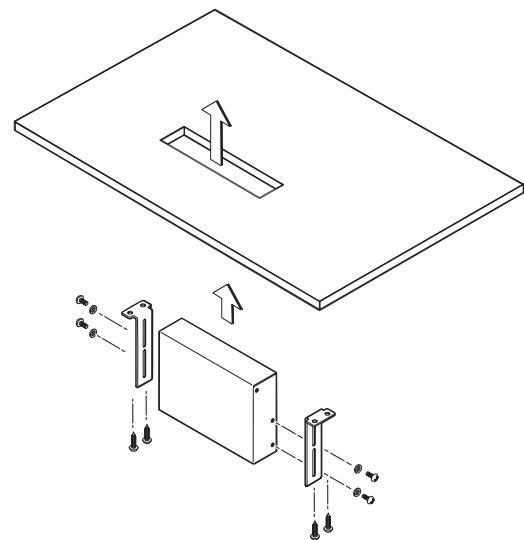
Under-furniture mounting the DVI DL

6. Drill $3/32"$ (2 mm) diameter pilot holes, $1/4"$ (6.3 mm) deep in the mounting surface at the marked screw locations.
7. Insert #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until slightly less than $1/4"$ of the screw head protrudes.
8. Align the mounting screws with the slots in the brackets and place the unit against the surface, with the screws through the bracket slots.
9. Slide the unit slightly forward or back, then tighten all four screws to secure it in place.

Through-furniture mounting

The DVI DL can be mounted through a desk or other furniture using an optional Extron MBD 129 through-desk mounting kit (part #70-077-02) as follows:

1. Loosely attach the mounting brackets to the unit using the four machine screws and washers supplied with the mounting kit.
2. Hold the unit against the inside of the surface through which it will be mounted. Mark the four screw holes on the inside of the surface to which you are mounting the device.
3. Cut out the material from the installation area with a jigsaw.



Through-desk mounting the DVI DL

4. Drill four pilot holes, each 3/32" in diameter by 1/4" deep, where you made marks.
5. Using the provided four wood screws, secure the brackets to the mounting surface.
6. Slide the DVI DL up and down in the mounting brackets until the front panel is at the desired height. Tighten the screws that secure the brackets in place.

If the screws are inaccessible to a screwdriver:

- a. Mark the location of the brackets relative to the screws.
- b. Remove the unit from inside the furniture.
- c. Tighten the screws.
- d. Replace the unit inside the surface (step 4).

Projector mounting

The DVI DL can be mounted on a projector bracket using either of the following optional Extron projector mounting kits:

- PMK 300 projector mounting kit (part #70-374-01)
- PMK 350 low profile projector mounting kit (part #70-563-02 [black] or part #70-563-03 [white])

PMK 300 mounting

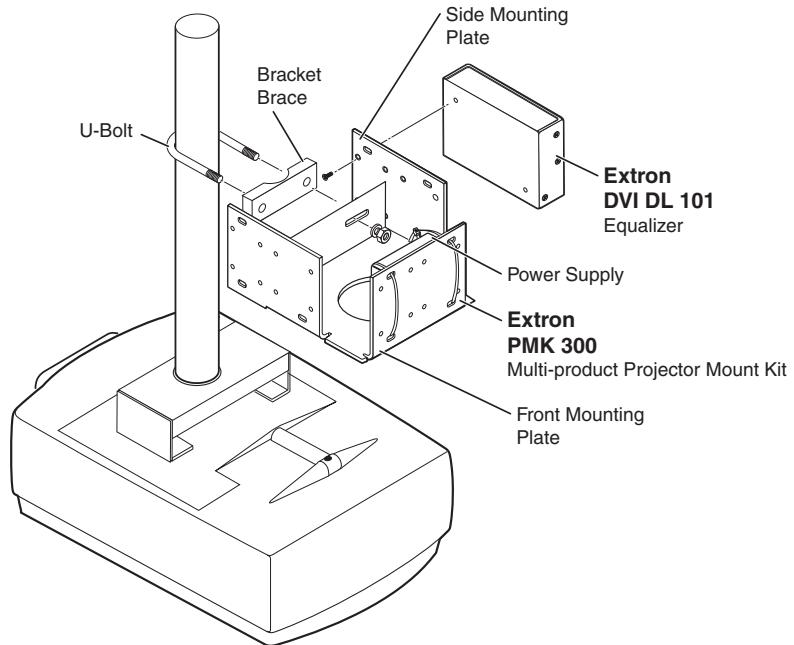
Mount the DVI DL to a PMK 300 bracket as follows:

1. If necessary, remove the feet from the bottom of the unit.
2. Mount the receiver to one of the bracket's three mounting plates using two of the supplied 4-40 x 3/16" screws in opposite (diagonal) corners to secure the device to the bracket. It can be vertically mounted facing either up or down (see the illustration below).

NOTE

On the side mounting plates, the device is typically mounted on the outside of the bracket.

On the front mounting plate, the device is typically mounted on the inside of the bracket.

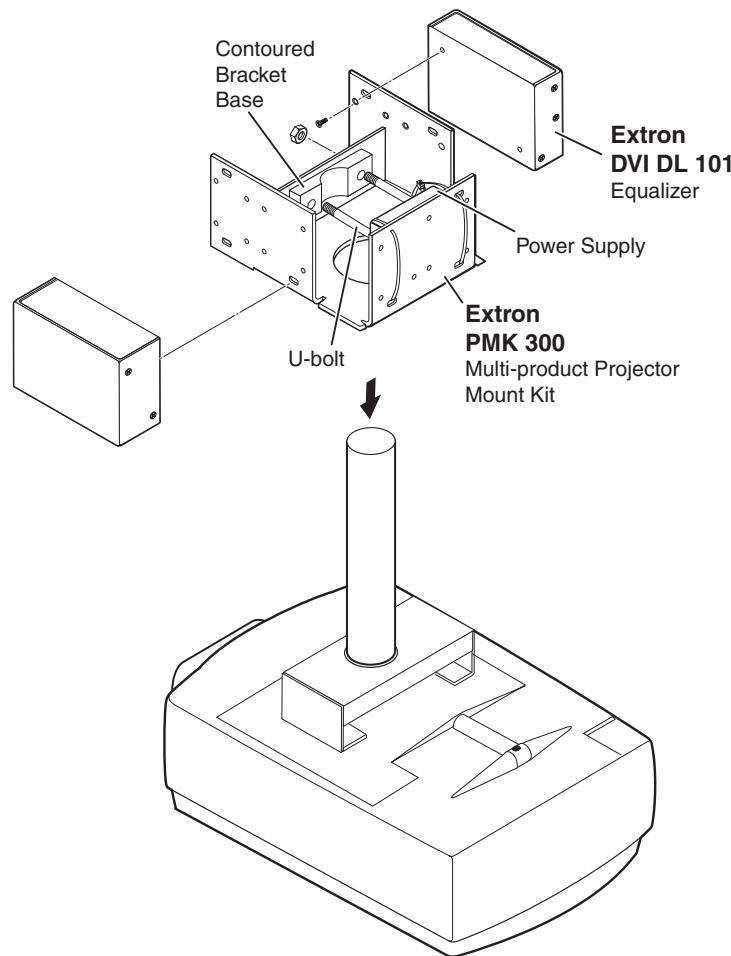


PMK 300 projector mounting a receiver

3. Strap the power supply to one of the brackets, using the two included tie wraps.

NOTE

The PMK 300 has a hole in the bottom plate that allows the projector pole to be inserted through the center of the plate, rather than outside of the plate). To install the PMK 300 in this configuration, slide the bracket up from the bottom of the pole before the projector is installed on the pole.



Mounting with the projector pole on the inside

4. Place the contoured bracket brace against the pole and opposite the back plate. The pole should fit snugly into the depression in the center of the bracket brace.
5. Place the U-bolt around the ceiling pole. Insert the two legs of the U-bolt through the round holes on the contoured bracket brace and then through the slotted holes on the bracket's mounting plate.

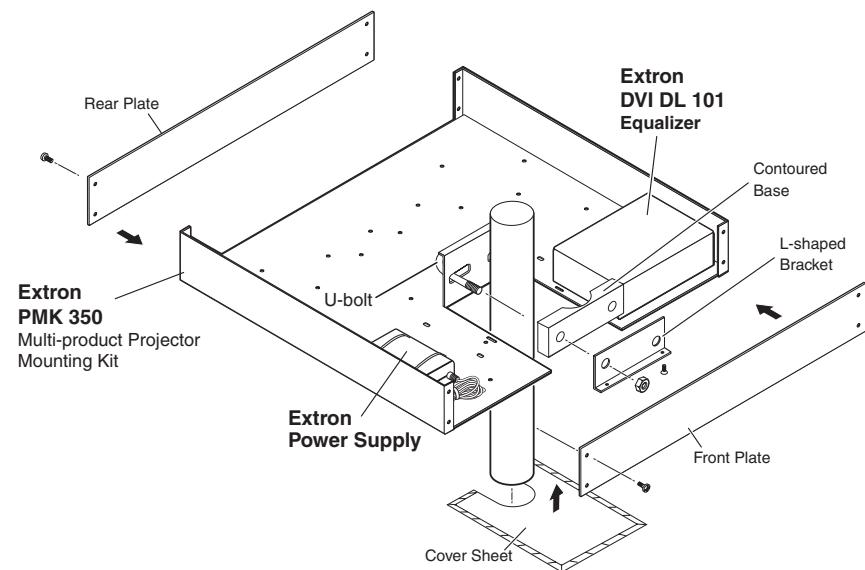
NOTE The supplied U-bolt fits a typical (1.5" to 2.0" diameter) ceiling pole.

6. Secure the bracket to the U-bolt with the included hex nuts, washers, and lock washers. Tighten the hex nuts just enough that they can be loosened by hand.

PMK 350 mounting

Mount the DVI DL to a PMK 350 bracket as follows:

1. Remove the front and rear plates from the PMK 350, using an Extron Tweaker or a #2 Philips screwdriver. Retain the screws to reattach the plates when you are finished.
2. If necessary, remove the feet from the bottom of the unit.
3. Secure the DVI DL to one side of the mounting tray, using two of the supplied 4-40 x 3/16" screws in opposite (diagonal) corners.



PMK 350 projector mounting a DVI DL

4. Using the two included tie wraps, strap the power supply to the PMK bracket.
5. If desired, remove the back panel of the PMK 350 and mount additional device(s) at the back of the bracket, as described in step 3.
6. Place the PMK 350 around the projector ceiling mounting pole.

Installation and Operation, cont'd

7. Assemble the U-bolt and the following parts in the following order (see the illustration below):
 - a. Pass the legs of the U-bolt through the slotted holes on the mount plate flange.
 - b. Place the legs around the projector pole.
 - c. Pass the legs through the holes in the contour base.

NOTE *The pole fits snugly into the depression in the center of the contoured base.*

- d. Pass the legs through the holes in the L-shaped bracket.

NOTE *The supplied U-bolt fits a typical (1.5" to 2.0" diameter) ceiling pole.*

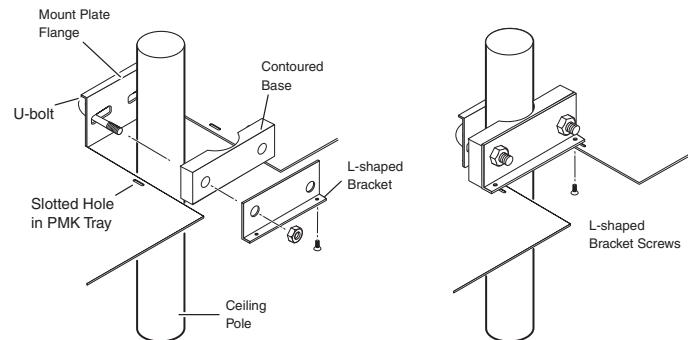


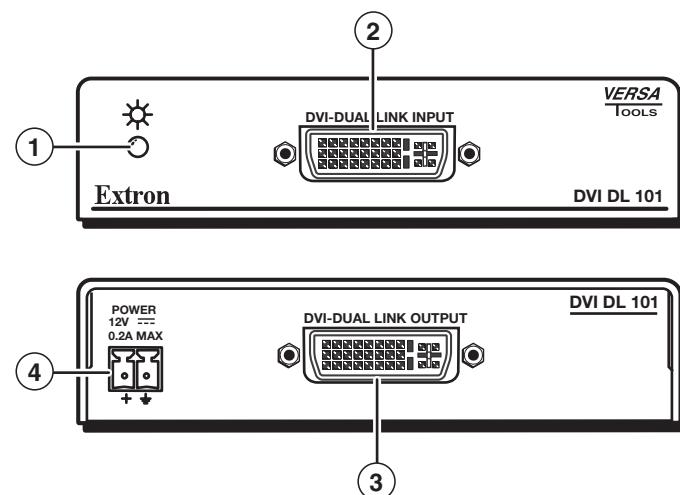
Figure 2-8 — Hanging the PMK 350 tray on the projector pole

8. Align the two holes in the bottom of the L-shaped bracket with the two holes in the base of the tray. Secure the L-bracket to the base by inserting two of the provided 6-32 x 5/16" screws through the aligned slots.
9. Move the PMK 350 up to the desired location on the ceiling pole, as close to the ceiling as desired.
10. Secure the L-shaped bracket to the U-bolt using the included hex nuts, washers, and lock washers. Tighten the hex nuts securely.

NOTE *Be sure to tighten the hex nuts securely enough that the PMK 350 does not slide down the ceiling pole. A socket wrench is recommended to tighten the hex nuts.*

11. Secure the front and rear plates to the mounting tray with four of the included #6 screws.
12. If desired, choose one of the provided four sizes of self-adhesive cover sheets, and apply it to the underside of the mounting tray.

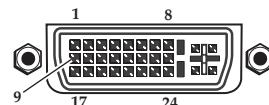
Front and Back Panel Features and Connections



DVI DL front and rear panels

- ① **Status LED** — This dual-color LED lights amber when the DVI DL is receiving power. When a DVI input signal is present, this LED lights green.
- ② **DVI input connector** — Plug the cable from the input source device into this dual link female DVI-I connector. Dual link rates of up to 2560x1600 @ 60 Hz and single link rates of up to 1920x1200 and 1080p @ 60 Hz are supported. The table on the next page shows the DVI pin configuration.

NOTE *Dual link DVI cables must be used for dual link DVI signals. If a single link DVI cable is used, only single link DVI signals are possible.*



Pin	Signal	Pin	Signal	Pin	Signal
1	TMDS data 2-	9	TMDS data 1-	17	TMDS data 0-
2	TMDS data 2+	10	TMDS data 1+	18	TMDS data 0+
3	TMDS data 2/4 shield	11	TMDS data 1 shield	19	TMDS data 0/5 shield
4	TMDS data 4-	12	TMDS data 3-	20	TMDS data 5-
5	TMDS data 4+	13	TMDS data 3+	21	TMDS data 5+
6	DDC clock	14	+5 V power	22	TMDS clock shield
7	DDC data	15	Ground (+5 V)	23	TMDS clock+
8	CEC control*	16	Hot plug detector	24	TMDS clock-

* CEC control on pin 8 is a proprietary usage, and is not the industry standard.

DVI connector pin assignments

Input cable lengths

To obtain the highest transmission rate of 330 MHz (dual link) or 165 MHz (single link), the maximum input cable length for the DVI DL 101 is 200' (61 m). Longer cables may be used at lower rates. High quality cable can increase the distance and rate of transmission. However, the achievable distance and speed are also contingent on the sensitivity of the input source and the display device.

Dual and single link modes

The DVI DL 101 can operate in dual link mode or single link mode; dual link DVI is backwards compatible with single link DVI.

NOTE *Operation in dual link mode requires that both the source and the display support dual link DVI signals. If they do not, the DVI DL 101 can operate in only single link mode.*

The table below shows the maximum cable lengths recommended for each resolution, in dual link mode and single link mode.

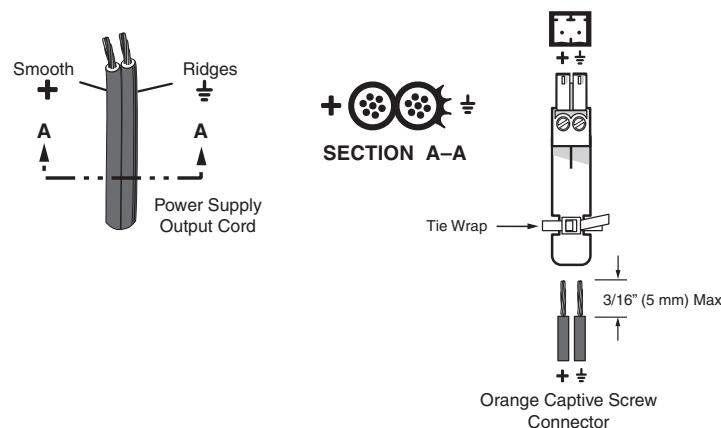
NOTE *Avoid using couplers and adapters between cables, as this can result in signal degradation.*

Video Resolution	Single Link Mode	Dual Link Mode
1280x1024		
1024x768	250'	275'
720p	(76 m)	(84 m)
1080i		
1920x1200		
1600x1200	200'	250'
1080p	(61 m)	(76 m)
2560x1600	N/A	200'
		(61 m)

③ **DVI output connector** — Plug the cable from a DVI output device into this female dual link DVI-I connector, following the pin configuration shown in the table on page 2-12. Output signals will be digital only. The maximum output cable length is 16.4' (5 m). Pin 14 provides +5 VDC power.

NOTE *Dual link DVI cables must be used for dual link DVI signals. If a single link DVI cable is used, only single link DVI signals are possible.*

④ **Power connector** — Plug the external 12 V power supply (provided with the unit) into this 2-pole captive screw connector. The figure on the next page shows how to wire the connector.



Wiring the power connector

CAUTION

When you are connecting the power supply, voltage polarity is extremely important. Applying power with incorrect voltage polarity could damage the power supply and the equalizer. Identify the negative lead by the ridges on the side of the cord (see the illustration above).

CAUTION

Do not tin the stripped power supply leads before installing the captive screw connector. Tinned wires are not as secure in the captive screw connectors and could be pulled out.

WARNING

The two power cord wires must be kept separate while the power supply is plugged in. Remove power before continuing.

To verify the polarity before connection, plug in the power supply with no load and check the output with a voltmeter.

Enabling the DDC Buffer

The DDC clock and data lines by default are routed straight through to the output, bypassing the DDC buffer.

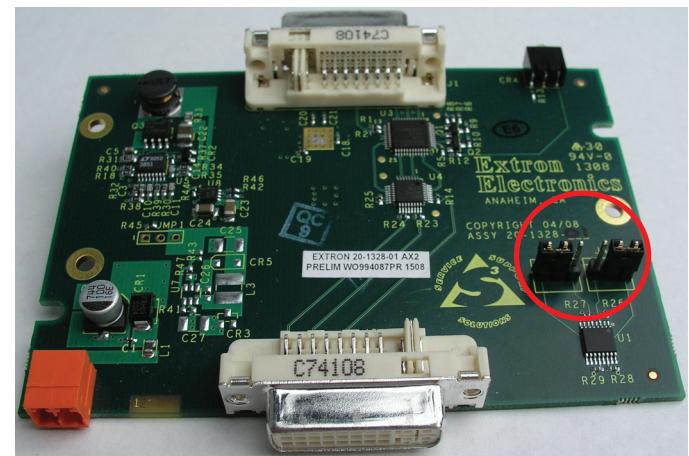
However, if you experience any of the following image problems, changing this setting to engage the DDC buffer should correct them.

- The image cuts in and out, or cuts out completely, after a period of time.
- The image is clear at first, then displays snow (HDCP error).
- No image appears.

- Incorrect color space selection (purple or blue tint)
- Corrupted EDID data (The computer or source cannot read the EDID of the connected display correctly due to a long cable run.)

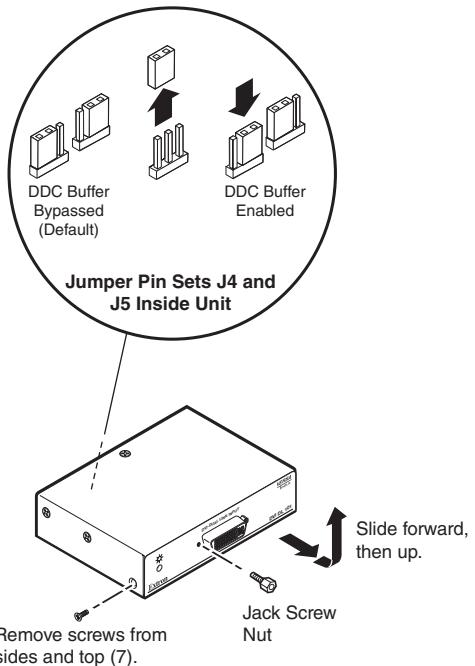
To enable the buffer,

1. Using an Extron Tweaker or other small Philips screwdriver, remove the seven screws (three on each side and one on top) that hold the top cover onto the unit.
2. Remove the two jack screws on either side of the DVI input connector on the front panel (see the illustration on the next page).
3. Slide the top cover forward until it clears the input connector, then lift it off the unit.
4. Facing the DVI DL rear panel, locate the two DDC jumpers (J5 and J4) on the two sets of three pins in the lower-right corner of the internal board. By default, these jumpers are on the middle and outside pins, which permits the DDC lines to pass straight through without buffering.



Jumpers on the internal board in default (outside) position

5. Lift each jumper off its pins and slide it down onto the **inside** and **middle** pins. See the illustration below.



6. Replace the top cover onto the unit, and slide it back until the DVI input connector protrudes through its slot in the front panel.
7. Replace the two jack screws and the seven Philips screws that you removed in step 1.



Appendix A

Specifications, Parts, and Accessories

Specifications

Included Parts

Optional Accessories

Cables and Adapters

Specifications, Parts, and Accessories

Specifications – DVI DL

NOTE

*Dual link DVI is backwards compatible with all single link DVI and HDMI signals.

Video

Maximum data rate.....	10 Gbps total (3.3 Gbps per color)
Maximum pixel clock.....	330 MHz (165 MHz per link)
Impedance.....	100 ohms
Resolution range	Dual link: Up to 2560x1500 @ 60 Hz Single link: Up to 1920x1200 or 1080p @ 60 Hz
Formats.....	RGB or YCbCr digital video
Standard	DVI 1.0, HDMI 1.2

Video input

Number/signal type.....	1 dual link DVI-D*
Connectors	1 female DVI-I
Nominal level	
Digital video	1.2 Vp-p (for TMDS)
DDC.....	TTL: 5 Vp-p
Input cable length	Up to 200' (61 m) at 2560x1600 or 1080p @ 60 Hz Longer distances are possible with lower rates and/or high quality cable.

NOTE

The transmission distance varies greatly depending on the signal resolution and on the type of cable, graphic card, and display used in the system.

Equalization	Automatic for up to -40 dB of cable loss
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Video output

Number/signal type.....	1 dual link DVI-D
Connectors	1 female DVI-I
Resolution range	Up to 1920x1200 or 1080p @ 60 Hz
Output cable length	Up to 16.4' (5 m)

General

External power supply	100 VAC to 240 VAC, 50/60 Hz, external; to 12 VDC, 1 A, regulated
Power input requirements	12 VDC, 0.2 A from an external power supply

Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling	Convection, no vents
Rack mount	Yes, with optional 1U, 9.5" deep rack shelf, part #60-190-01 (RSU 129) or #60-604-01 (RSB 129); 1U, 6" deep rack shelf, part #60-190-10 (RSU 126) or #60-604-10 (RSB 126); or 3.5" deep VersaTools® rack shelf, part #60-190-20 (RSF 123) or #60-604-20 (RSB 123)
Standard	Also furniture-mountable with optional under-desk mounting kit, part #70-077-01 (MBU 125) and through-desk mounting kit, part #70-077-02 (MBD 129)
Enclosure type	Metal
Enclosure dimensions.....	1.0" H x 4.3" W x 3.0" D (1/4 rack wide) (2.5 cm H x 10.9 cm W x 7.6 cm D) (Depth excludes connectors.)
Product weight	0.5 lbs (0.3 kg)
Shipping weight	3 lbs (2 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety.....	CE, UL, CUL, C-tick
Compliances.....	CE, FCC Class A, VCCI, C-tick, ICES
MTBF.....	30,000 hours
Warranty	3 years parts and labor

NOTE All nominal levels are at ±10%.

NOTE Specifications are subject to change without notice.

Specifications, Parts, and Accessories, cont'd

Included Parts

These items are included in each order for the DVI DL 101:

Included parts	Replacement part number
DVI DL 101 Multi-Rate Equalizer	60-962-01
12 VDC, 2 A external power supply kit	70-055-01
IEC power cord	
Rubber feet, 4, unattached	
Tweaker (small screwdriver)	
<i>DVI DL 101 User's Manual</i>	

Optional Accessories

The following items are optional and can be purchased separately for the DVI DL 101:

Accessories	Part number
MBD 129 Through-desk Mount Kit	70-077-02
MBU 125 Under-desk Mount Kit	70-077-01
RSU 129 1U, 9.5" deep, universal rack shelf kit	60-190-01
RSB 129 1U, 9.5" deep, basic rack shelf	60-604-01
RSU 126 1U, 6" deep, universal rack shelf kit	60-190-10
RSB 126 1U, 6" deep, basic rack shelf	60-604-10
RSF 123 1U, 3.5" deep, VersaTools® rack shelf kit	60-190-20
RSB 123 1U, 3.5" deep, basic VersaTools rack shelf	60-604-20

Cables and Adapters

The following cables and adapters may be purchased for use with the DVI DL 101:

Cable/Adapter	Part number
IN9700 Series DVI (25', 35', 50', and 75' lengths)	26-584-xx
DVID SL Series DVI (3', 6', and 15' lengths)	26-585-xx
HDMI M-DVI-D M Series DVI to HDMI (3', 6', 12', 25', 35', and 50' lengths)	26-614-xx
HDMI M-M Series HDMI (3', 6', 12', 25', 35', and 50' lengths)	26-613-xx
HDMIM-DVIDF HDMI male to DVI-D female adapter	26-617-01
HDMIM-DVIDM HDMI female to DVI-D male adapter	26-616-01
HDMIF-DVIDF HDMI female to DVI-D female adapter	26-618-01

Specifications, Parts, and Accessories, cont'd

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